National Aeronautics and Space Administration

TECHNOLOGY TRANSFER OPPORTUNITY

High-Performance Polyimide Powder Coatings

Researchers at NASA's Kennedy Space Center have developed advanced powder coatings for longer-lasting, improved corrosion control. The results of preliminary tests of the coatings and their resistance to salt spray corrosion are very encouraging, and commercial partners are sought for further development.

The National Aeronautics and Space Administration (NASA) seeks partners interested in the further development and commercial application of High-Performance Polyimide Powder Coatings for longer-lasting, improved corrosion control. The high salt content of Kennedy Space Center's (KSC's) natural marine environment, in combination with the sunlight, heat, and humidity of the subtropical Florida climate, makes KSC the country's most corrosive area, according to the American Society of Metals. These highly corrosive conditions are exacerbated by extreme heat and acidic exhaust from the solid rocket motors of the space vehicles.

Building off their expertise with polyimide materials, researchers at KSC have developed advanced polyimide powder coatings that offer superior performance over






Benefits

- Improved corrosion control
- Temperature resistance
- Chemical resistance
- Electrical stability
- Flame resistance
- Long-lasting protection

Applications

- Bridges
- Pipes and other infrastructure components
- Machinery
- Exposed metal parts and structures
- Automobile components

traditional powder coatings. The results of preliminary tests of the coatings and their resistance to salt spray corrosion are very encouraging, and commercial partners are sought for further development. NASA is developing corrosion-resistant coatings for the structures used at KSC's launch pads, such as the mobile launcher and cryogenic storage tanks. These facilities will soon be used much more often as commercial space companies begin to step up their launch programs.

Technology Advantages

Powder coatings are used throughout industry to coat a myriad of metallic objects. This method of coating has gained popularity because it conserves materials and eliminates volatile organic compounds. Resins traditionally chosen for powder coatings have low melting points that enable them to melt and flow into a smooth coating before being cured to a durable surface.
High-performance resins, such as Teflon, nylon, and polyimide, have not been found suitable for use in powder coatings because of their high melting points. However, newly developed polyamic acid resins with low melting points can be used in a powder coating. These polyamic acid resins, when sprayed onto metal surfaces, can be cured in conventional powder coating ovens to deliver high-performance polyimide coatings. Polyimide powder coatings would offer superior heat and electrical stability as well as superior chemical resistance over other types of powder coatings.

Co-Development Opportunities

NASA's Kennedy Space Center is seeking commercial partners for further co-development of this innovative technology. If your company is interested in the High-Performance Polyimide Powder Coatings technology, please make reference to Case Number KSC-12777 and contact:

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